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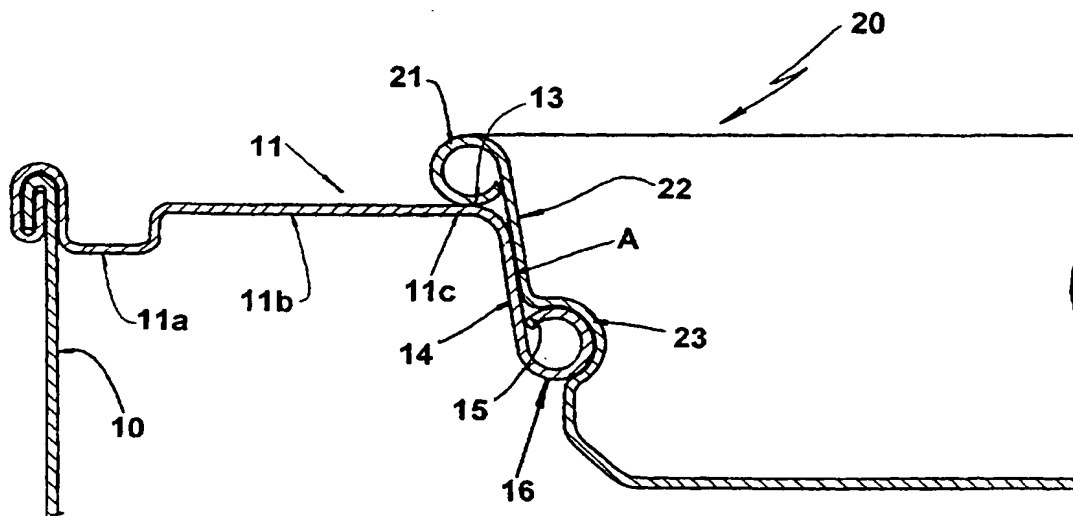
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[Continued on next page]

(54) Title: CAN FOR DANGEROUS GOODS



(57) Abstract: A can for dangerous goods, comprising a generally cylindrical lateral wall (10), and an upper wall (11) having: an external peripheral portion (11a), which is double seamed to the lateral wall (10); a median portion (11b) with a larger radial extension; and an internal peripheral portion (11c), defining a closing seat (13) and from which depends a tubular wall (14) defining a discharge opening (A) and incorporating, internally, a tubular rib (16), onto which will be fitted a peripheral recess (23) of a lid (20) having a peripheral edge (21) to be seated onto said closing seat (13), wherein the internal peripheral portion (11c) and the median portion (11b) of the upper wall (11) are mutually coplanar, one being the radial extension of the other.

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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

## CAN FOR DANGEROUS GOODS

Field of the Invention

The present invention refers to an improvement in the construction of cans, in which the annular upper wall is provided with a discharge opening, to be closed by a press fit lid, and which occupies a substantial part or practically the whole area of said upper wall. The invention allows said can to be used for containing dangerous goods.

Background of the Invention

It is known from the prior art (figures 1 and 2 of the appended drawings) the construction of a can disclosed in Brazilian Patent PI 9406843-5 of the same applicant, according to which the upper wall 11 of the can 10 presents a substantially circular opening A, which is defined internally to a closing seat 13 formed on the upper wall 11, along the periphery of the opening A, and from which depends a tubular wall 14, with its lower portion being inwardly upwardly bent to the inside of the opening A, until its free end edge 15 reaches an adjacent position to said tubular wall 14. In this prior art construction of the same applicant, the tubular wall 14, which surrounds and defines the opening A, incorporates a continuous tubular rib 16 with a circular cross section and which is provided in a plane that is lowered in relation to the plane of the closing seat 13.

Still according to this prior art solution, there is provided a lid 20, having a peripheral edge 21, usually defined by a tubular rim, which is outwardly downwardly bent and from which peripheral edge 21 is downwardly projected a circular lateral wall 22 provided with a peripheral recess 23, having an approximately semi-circular section, and which is

dimensioned to be fitted around the continuous tubular rib 16 upon seating the lid 20 onto the opening A of the can. The peripheral edge 21 is seated onto the closing seat 13 when the lid 20 is fitted onto the opening A.

Although resulting in an excellent axial locking of the lid 20 in the closed condition, further eliminating the risks of injuries during handling and of contamination of the stored product by contact with non-varnished parts of the metallic sheet of the lid 10, this prior art solution is also required to present an increased structural strength, in order to meet the specifications required for the recipients containing dangerous products.

Figures 1 and 2 show two distinct constructions for the upper wall 11 of the can 10 produced according to the solution proposed in said prior art patent PI9408643-5. As it can be observed, the upper wall 11, in both configurations is not maintained flat until reaching the tubular wall 14 that surrounds the opening A, being upwardly (figure 1) or downwardly (figure 2) bent, in order to define a closing seat 13 in a plane that is axially distant from the plane of the upper wall 11.

Nevertheless, the deformation of the upper wall 11 in the region adjacent to the closing seat 13 leads to the weakening of the structure of said upper wall 11, allowing the destructive deformation of said upper wall when the can is submitted, during a certain time, to a determined level of internal pressure, which should be supported by containers for dangerous goods. Such deformation in the upper wall of the prior art cans considered herein allows, at most, to increase the strength of the upper wall 11 against axial forces from the outside to the inside of the can. However, it

has been observed that the existence of said deformations considerably reduces the resistance of the upper wall 11 when it is submitted to axial forces from the inside to the outside of the can, which are transmitted to said upper wall by the lid, particularly in the region of the closing seat 13 when the can is internally pressurized. These axial forces from the inside to the outside of the can act against the region of the closing seat 13 and, the larger the diameter of the lid in relation to the diameter of the cylindrical upper wall 11 of the can, the higher will be said forces.

It should be further understood that the deformations of the upper wall 11 for the definition of the closing seat 13 are usually obtained by spinning and drawing the metallic sheet; reducing, in the deformed regions, the thickness of the sheet, and consequently the resistance thereof.

These cans already belonging to the state of the art are not resistant enough to meet the requirements of the international and national regulations regarding shipping of dangerous goods. In the case in which the lids are retained only by attrition, they are easily released from the can when the internal pressure of the can is increased to values slightly higher than the atmospheric pressure. Even in the case of the lids illustrated in figures 1 and 2, which are provided with mechanical locking, when the can is submitted to expected internal pressures, the upper ring is deformed inside out, expelling the lid.

In order to comply with the regulations directed to the shipping of dangerous goods, the known cans require the provision of auxiliary protecting devices, which substantially increase the cost of the packaging system.

Object of the Invention

The object of the present invention is to provide a can having an annular upper wall, which surrounds the discharge opening, to be closed by a press fit lid, and which is constructed to give the can enough structural resistance, in order to comply with the requirements imposed to these type of containers designed for dangerous goods.

Disclosure of the Invention

10 The object mentioned above is attained by providing a can for dangerous goods, having an upper wall provided with an external peripheral portion, which is double seamed to the lateral wall; a median portion with a larger radial extension, and an internal peripheral  
15 portion, defining a closing seat and from which depends a tubular wall defining a discharge opening and incorporating, internally, a tubular rib, onto which will be fitted a peripheral recess of a lid having a peripheral edge to be seated onto said  
20 closing seat.

According to the invention, the internal peripheral portion and the median portion of the upper wall are mutually coplanar, one being the radial extension of the other.

25 With the new construction, the deformed, spun and drawn parts are eliminated from the upper wall of the can, considerably increasing the structural resistance of said can, which now complies with the regulations both from the United Nations and from Brazil regarding  
30 shipping of dangerous products, particularly those at level 3 (chemical products containing up to 5% solvents) which must be stored in cans capable of resisting during at least 5 minutes under an internal pressure of 100 Kpa.

35 The constructive solution proposed herein increases

the resistance to the pressure exerted from the inside to the outside of the can and allows the cans with a volume higher than 250 ml to meet the requirements imposed by the international regulations, being thus  
5 officially approved for shipping dangerous products.

The present invention, which is a development based on the axial locking of the reclosable press fit lid disclosed in Brazilian Patent PI9408643-5 of the same applicant, allows obtaining a can of simple  
10 construction and reduced cost, which is perfectly adequate to the international regulations related to the shipping of dangerous products.

#### Brief Description of the Drawings

The invention will be described below, with reference  
15 to the attached drawings, in which:

Figure 1 is a partial cross-sectional view of the upper wall of a can provided with a lid and constructed according to a possible embodiment of the prior art;

20 Figure 2 is a similar view to that of figure 1, but illustrating a can constructed according to another embodiment of the prior art;

Figure 3 is a similar view to those of figures 1 and 2, but illustrating a can constructed according to an  
25 embodiment of the present invention; and

Figure 4 is a similar view to that of figure 3, but illustrating another embodiment of the present invention.

#### Description of the Illustrated Embodiments

30 In the prior art embodiment illustrated in figures 1 and 2, the present can comprises a generally cylindrical lateral wall 10, and an upper wall 11 having: an external peripheral portion 11a, which is conventionally double seamed to an end edge of the  
35 lateral wall 10; a median portion 11b with a larger

radial extension; and an internal peripheral portion 11c, into which is incorporated and from which depends a tubular wall 14, defining a discharge opening A.

In the embodiment of figure 1, in the internal peripheral portion 11c of the upper wall 11 is defined a closing seat 13, which is formed by spinning applied to said internal peripheral portion 11c, causing said internal peripheral portion 11c and said closing seat 13 defined thereby to occupy a level that is superior to the plane containing the median portion 11b.

The spinning of the internal peripheral portion 11c forms a continuous circular projection, whose cross section has the shape of an open and inverted "V" with a rounded vertex, and which defines the closing seat 13, and with the inner lateral leg extending downwardly, in order to define the tubular wall 14. In this type of can, little importance is given to the internal volumetric gain, without altering the external dimensions of the container, and the upper wall 11 develops from the external peripheral portion 11a until reaching the region of the closing seat 13, in a single plane orthogonal to the axis of the can. The deformation of the internal peripheral portion 11c of the upper wall 11, upwardly in the region of the closing seat 13, is usually obtained by spinning, weakening the regions presenting plane change close to said closing seat 13, and causing the latter to collapse when the can is submitted to determined efforts due to internal pressure.

In the prior art embodiment illustrated in figure 2, the upper wall 11 of the can has its median portion 11b occupying a substantial part of the radial extension of said upper wall 11, provided in a plane that is slightly elevated in relation to the external peripheral portion 11a, having a small radial



extension and which is double seamed to the lateral wall 10 of the can.

The elevation of the median portion 11b of the upper wall 11 is desirable to obtain a corresponding gain in the volumetric capacity of the can.

In this known can construction, the closing seat 13 is formed by lowering the internal peripheral portion 11c of the upper wall 11, which lowering is obtained by spinning and drawing the metallic sheet, weakening the can in this region, as already mentioned in relation to the embodiment of figure 1.

In the solution of the present invention, illustrated in figures 3 and 4, the closing seat 13 is defined by an internal peripheral portion 11c, which is coplanar to the median portion 11b of the upper wall 11.

The new construction proposed by the present invention allows to eliminate, from the upper wall 11, the regions thereof deformed by spinning, in order to define the closing seat 13 in a plane different from that containing the median portion 11b of the upper wall 11.

In the embodiment illustrated in figure 3, the upper wall 11 has its median portion 11b and internal peripheral portion 11c contained in the same plane, which is slightly elevated in relation to the external peripheral portion 11a, leading to a corresponding gain in the volumetric capacity of the can.

It should be understood that the upper wall 11 may be formed with its external peripheral portion 11a, median portion 11b, and internal peripheral portion 11c entirely contained in a single plane, extending from the lateral wall of the can, up to the region in which is defined the closing seat 13 and from which depends the tubular wall 14, as illustrated in figure 4.

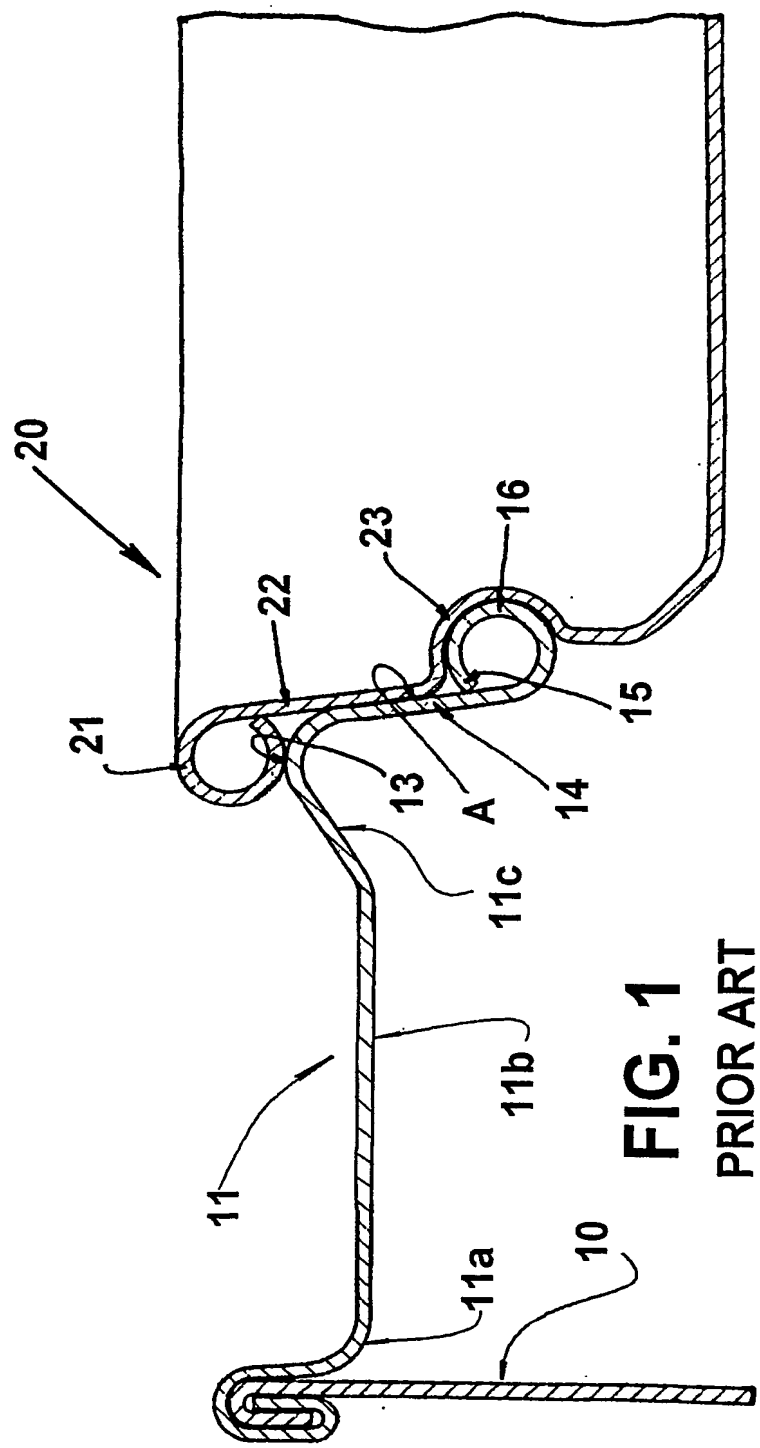
It should be observed that the deformations produced in the upper wall 11, in order to elevate the median portion 11b and the internal peripheral portion 11c in relation to the external peripheral portion 11a, have  
5 small values and are located at small radial distances from the elevated wall 10, producing no relevant structural weakening in the can, as it occurs with the deformations existing in the known solutions, in which the closing seat is defined in planes provided above  
10 or below the plane that contains the median portion 11b and the internal peripheral portion 11c of the upper wall 11 of the can.

## CLAIMS

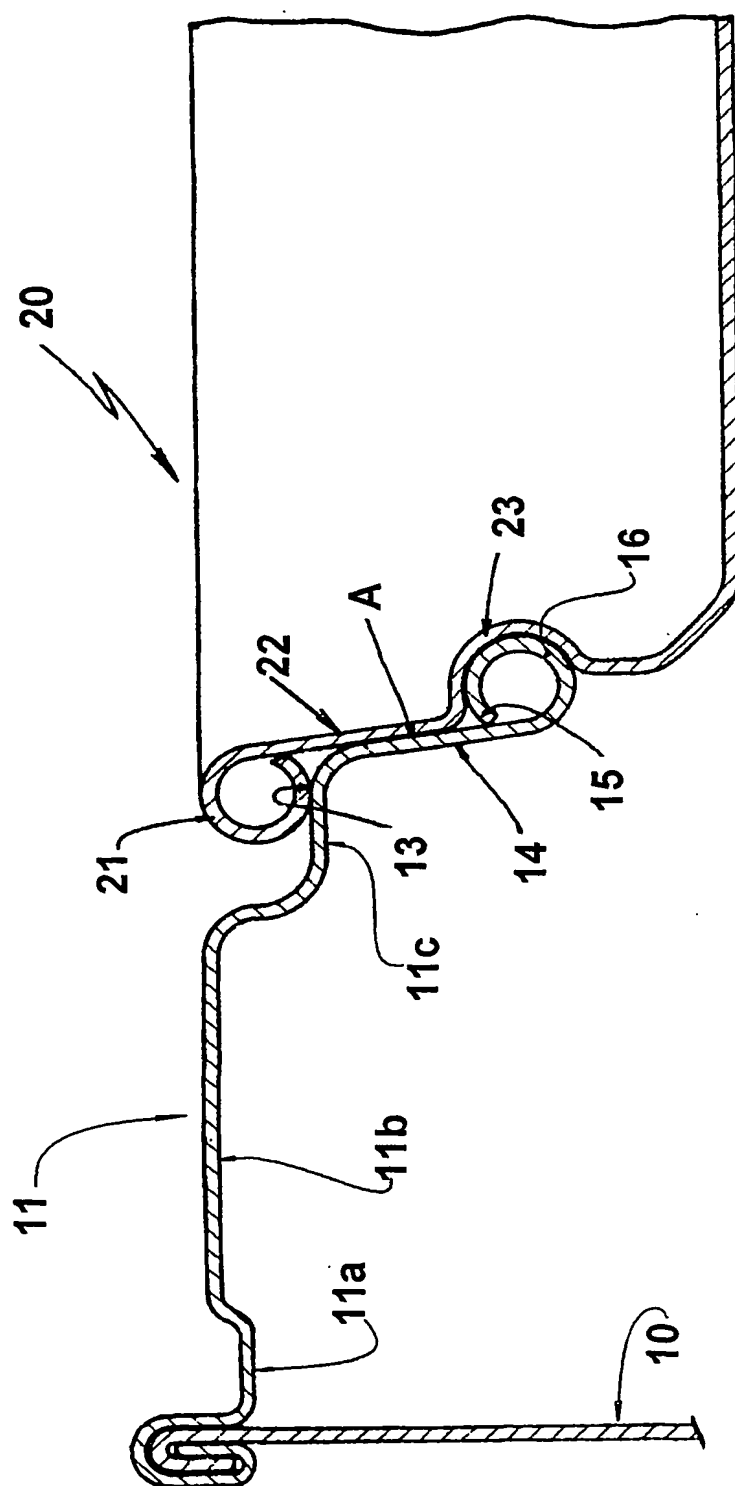
1. A can for dangerous goods, comprising a generally cylindrical lateral wall (10), and an upper wall (11) having: an external peripheral portion (11a), which is double seamed to the lateral wall (10); a median portion (11b) with a larger radial extension; and an internal peripheral portion (11c), defining a closing seat (13) and from which depends a tubular wall (14) defining a discharge opening (A) and incorporating, internally, a tubular rib (16), onto which will be fitted a peripheral recess (23) of a lid (20) having a peripheral edge (21) to be seated onto said closing seat (13), characterized in that the internal peripheral portion (11c) and the median portion (11b) of the upper wall (11) are mutually coplanar, one being the radial extension of the other.

2. Can, according to claim 1, characterized in that the median portion (11b) and the internal peripheral portion (11c) of the upper wall (11) of the can are coplanar to the external peripheral portion (11a) of said upper wall (11).

3. Can, according to claim 1, characterized in that the median portion (11b) and the internal peripheral portion (11c) of the upper wall (11) of the can are provided in a plane that is slightly elevated in relation to the external peripheral portion (11a) of said upper wall (11).



**FIG. 1**  
**PRIOR ART**



**FIG. 2**  
**PRIOR ART**

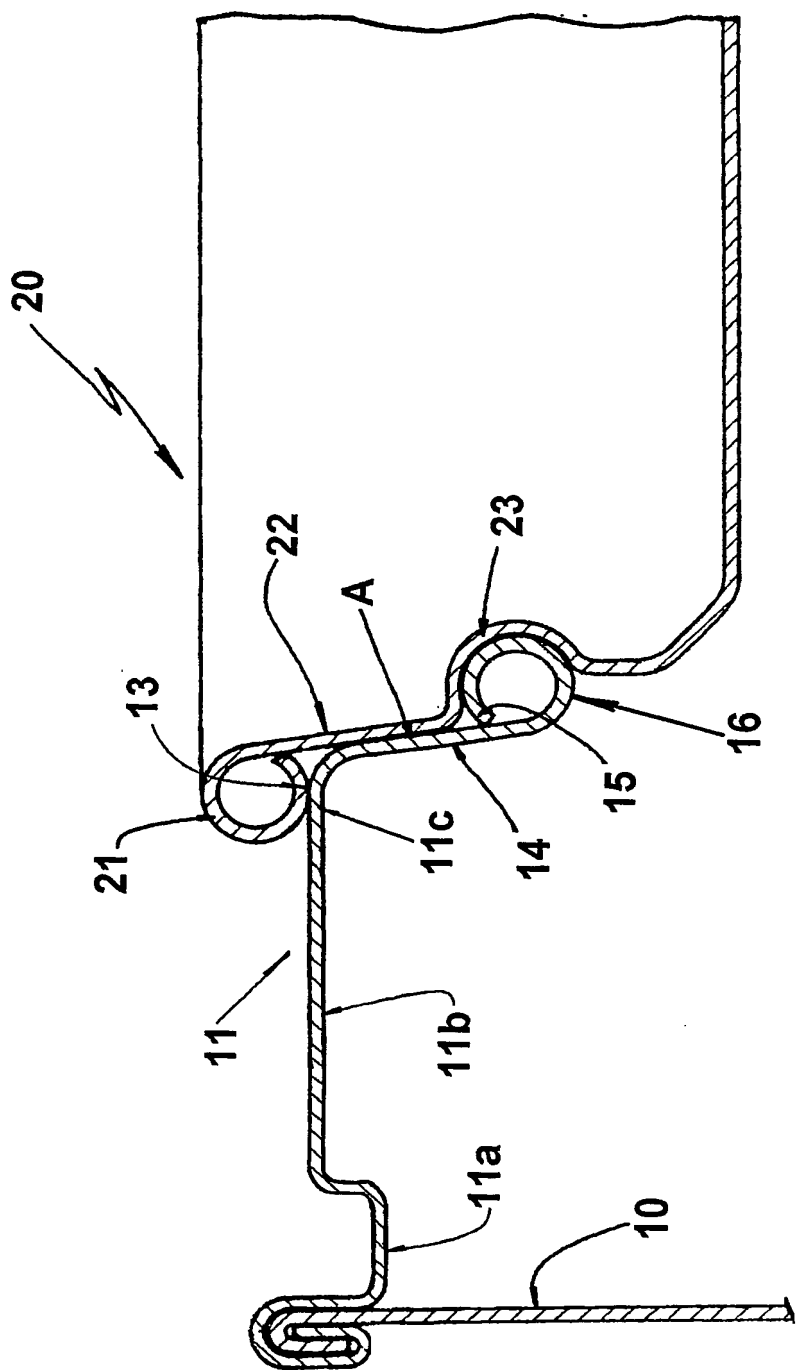


FIG. 3

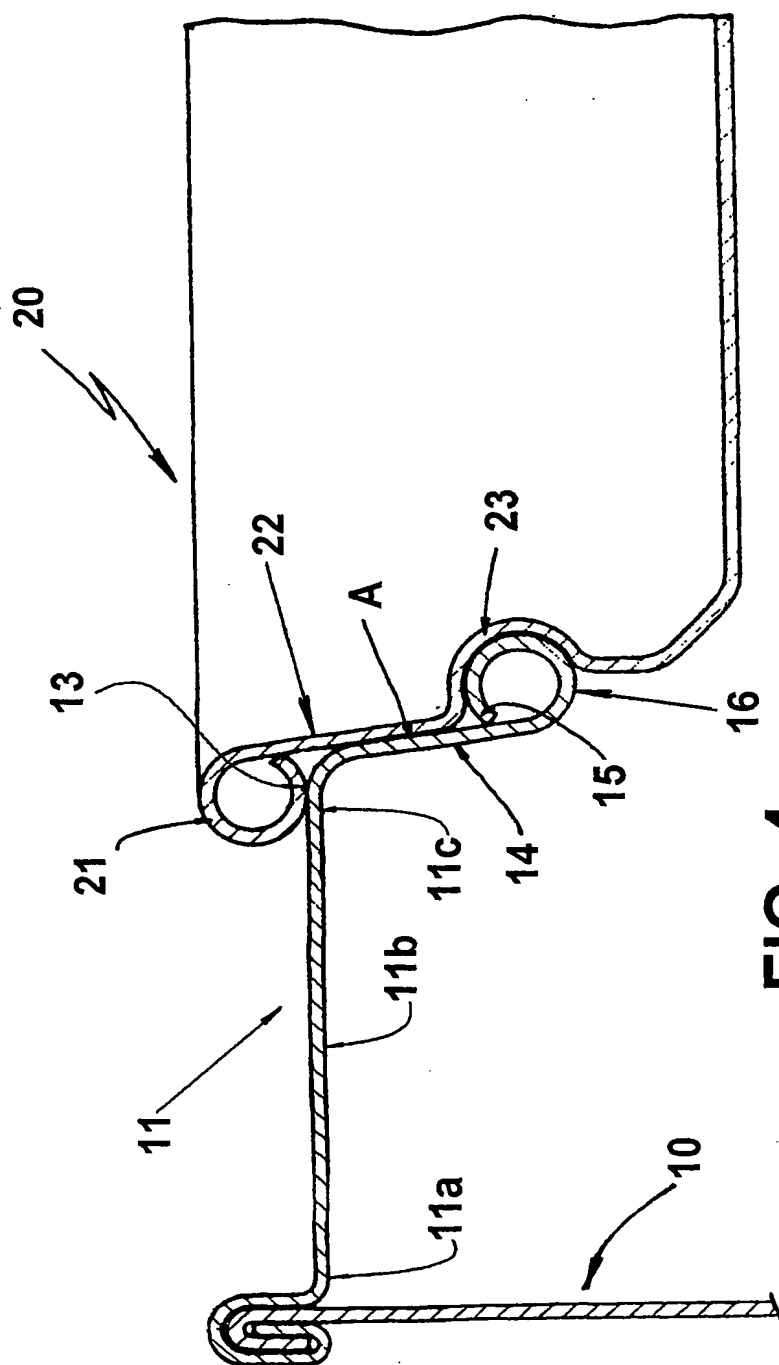


FIG. 4

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/BR 01/00151

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B65D43/02

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 899 352 A (GUARDA MANOEL JOSE ET AL) 4 May 1999 (1999-05-04) column 2, line 58 -column 4, line 16; figures	1-3
Y	US 4 728 003 A (DAVEY KENNETH G) 1 March 1988 (1988-03-01) column 2, line 46 -column 4, line 27; figures	1-3
A	US 6 085 934 A (ALVARES ANTONIO CARLOS TEIXEIR ET AL) 11 July 2000 (2000-07-11) column 2, line 61 -column 5, line 46; figures	1-3
	-/--	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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\*&\* document member of the same patent family

Date of the actual completion of the international search

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## INTERNATIONAL SEARCH REPORT

International Application No.

.../BR 01/00151

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 95 03225 A (BRASILATA S A EMBALAGENS METAL ; GUARDA MANOEL JOSE (BR); LABATE PE) 2 February 1995 (1995-02-02) page 3, line 20 -page 7, line 15; figures -----	1-3

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/BR 01/00151

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5899352	A	04-05-1999	BR 7400485 U	28-11-1995
			AT 173705 T	15-12-1998
			WO 9529854 A1	09-11-1995
			CA 2165989 A1	09-11-1995
			CN 1128975 A ,B	14-08-1996
			EP 0706486 A1	17-04-1996
			ES 2126904 T3	01-04-1999
			JP 3229885 B2	19-11-2001
			JP 9501641 T	18-02-1997
US 4728003	A	01-03-1988	GB 2190663 A	25-11-1987
			DK 257987 A	23-11-1987
			EP 0246783 A2	25-11-1987
			FI 872209 A	23-11-1987
			NO 872083 A	23-11-1987
US 6085934	A	11-07-2000	BR 9702736 A	09-03-1999
			AU 9056598 A	01-03-1999
			WO 9907612 A1	18-02-1999
			CN 1236349 T	24-11-1999
			EP 0936998 A1	25-08-1999
			JP 2000508279 T	04-07-2000
			JP 3244277 B2	07-01-2002
WO 9503225	A	02-02-1995	BR 7301199 U	21-03-1995
			WO 9503225 A1	02-02-1995
			DE 69403769 D1	17-07-1997
			DE 69403769 T2	20-11-1997
			EP 0662065 A1	12-07-1995